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WESTMAN CHAMPLIN (MICROSOFT CORPORATION)
SUITE 1400
900 SECOND AVENUE SOUTH
MINNEAPOLIS, MN 55402-3319

EXAMINER
COUGHLAN, PETER D

ART UNIT	PAPER NUMBER
2129	

DATE MAILED: 08/28/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>05 July 2006</u>.

2a)☒ This action is **FINAL.**   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-9 and 11-36</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-9 and 11-36</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>10 December 2003</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>6/6/2004</u>.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____ .

Detailed Action

1.   This office action is in response to an AMENDMENT entered July 5, 2006 for the

patent application 10/732741 filed on December 10, 2003.

2.   The First Office Action of March 8, 2006 is fully incorporated into this Final Office

Action by reference.

Status of Claims

3   Claims 1-9, 11-36 are pending.

35 USC § 101

4.   35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine,
> manufacture, or composition of matter, or any new and useful improvement
> thereof, may obtain a patent therefor, subject to the conditions and requirements
> of this title.

Claims 1-9, 11-36 are rejected under 35 U.S.C. 101 for nonstatutory subject

matter. The computer system must set forth a practical application of that § 101 judicial

exception to produce a real-world result. Benson, 409 U.S. at 71-72, 175 USPQ at 676-

77. The invention is ineligible because it has not been limited to a substantial practical application. A collaboration bootstrapping algorithm that improves both classifiers is still an abstract. Please see the interim guidelines for examination of patent applications for patent subject matter eligibility published November 22, 2005 in the official gazette.

In determining whether the claim is for a "practical application," the focus is not on whether the steps taken to achieve a particular result are useful, tangible and concrete, but rather that the final result achieved by the claimed invention is "useful, tangible and concrete." If the claim is directed to a practical application of the § 101 judicial exception producing a result tied to the physical world that does not preempt the judicial exception, then the claim meets the statutory requirement of 35 U.S.C. § 101. The classification of data is an abstract concept. Using the classifications for a purpose or function is what is needed for the invention to have a tangible result.

The invention must be for a practical application and either:

1) specify transforming (physical thing) or

2) have the FINAL RESULT (not the steps) achieve or produce a

useful (specific, substantial, AND credible),

concrete (substantially repeatable/ non-unpredictable), AND

tangible (real world/ non-abstract) result.

A claim that is so broad that it reads on both statutory and non-statutory subject matter, must be amended, and if the specification discloses a practical application but the claim is broader than the disclosure such that it does not require the practical application, then the claim must be amended.

Claims that recites a computer that solely calculates a mathematical formula for

classification only is not statutory.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form
the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) A patent may not be obtained though the invention is not identically disclosed or described as set
forth in section 102 of this title, if the differences between the subject matter sought to be patented and
the prior art are such that the subject matter as a whole would have been obvious at the time the
invention was made to a person having ordinary skill in the art to which said subject matter pertains.
Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-9, 11-13, 18-25, 27-36 are rejected under 35 U.S.C. 102(a) (hereinafter

referred to as **Lian**) being anticipated by Lian, 'Uncertainty Reduction in Collaborative

Bootstrapping: Measure and Algorithm'.

Claim 1

Lian anticipates receiving labeled data (**Lian,** p5, C2:33-38; 'Labeled data' of

applicant is equivalent to 'labeled training set' of Lian.); receiving unlabeled data (**Lian,**

p5, C2:33-38; 'Unlabeled data' of applicant is equivalent to 'unlabeled training set' of

Lian.); constructing a first classifier and a second classifier using the labeled data (**Lian,**

p2, C2:26-36; 'First and second classifier' of applicant is equivalent to the functions h_1

and h_2 of Lian.); performing uncertainty reduction comprising: selecting a instances from

the unlabeled data that are uncertain with respect to the first classifier (**Lian,** p3, C1:27-

34; 'Uncertain with respect to the first classifier' of applicant is equivalent to 'U(h_1) = P({x

| h_1(x) = $\perp$, x $\in$ X })' of Lian.); and selecting instances from the unlabeled data that are

uncertain with respect to the second classifier (**Lian,** p3, C1:27-34; 'Uncertain with

respect to the second classifier' of applicant is equivalent to 'U(h_2) = P({x | h_2(x) = $\perp$, x $\in$

X })' of Lian.); labeling the instances uncertain to the first classifier using the second

classifier to form a first labeled set (**Lian,** p3, C2:11-24'Using the second classifier' of

applicant is equivalent to 'with respect to' of Lian. 'Labeling the instance of uncertain' of

applicant is equivalent to 'UR' of Lian. UR(h_1 \ h_2) = P ({ x | h_1 (x) = $\perp$, h_2 (x) $\neq$ $\perp$, x $\in$ X

}): and labeling the instances uncertain to the second classifier using the first classifier

to form a second labeled set. (**Lian,** p3, C2:11-24'Using the first classifier' of applicant is

equivalent to 'with respect to' of Lian. 'Labeling the instance of uncertain' of applicant is

equivalent to 'UR' of Lian. UR(h_2 \ h_1) = P ({ x | h_2 (x) = $\perp$, h_1 (x) $\neq$ $\perp$, x $\in$ X })

Claim 2

Lian anticipates receiving labeled data includes receiving data assigned to

classes and wherein receiving unlabeled data includes receiving data capable of being

assigned to classes. (**Lian,** p5, C2:33-38; 'labeled data' of applicant is equivalent to

'labeled training set' of Lian. 'Unlabeled data' of applicant is equivalent to 'unlabeled

training sets' of Lian.)

Claim 3

Lian anticipates reconstructing the first and second classifiers using at least the first labeled set. (**Lian,** p1, C2:26-35; 'Reconstruction of the classifiers' of applicant is equivalent to 'improve the performance' of Lian.)

Claim 4

Lian anticipates selecting a instances uncertain to the first classifier includes selecting instances of the unlabeled data as a function of uncertainty. (**Lian,** p5, C1:35-42; 'Selecting an instance' of applicant is equivalent to 'separated the data' of Lian.)

Claim 5

Lian anticipates selecting instances as a function of uncertainty includes calculating probabilities.(**Lian,** p3, C1:27-34; 'Probabilities' of applicant is equivalent to 'P' of Lian.)

Claim 6

Lian anticipates calculating probabilities includes calculating probabilities that the first classifier is unable to label some instances of the unlabeled data. (**Lian,** p3, C1:27-34; 'Probabilities' of applicant is equivalent to 'P' of Lian. 'Unable to label' of applicant is equivalent to 'U(h)' of Lian.)

Claim 7

Lian anticipates calculating at least one value of uncertainty used to select the instances uncertain to the first classifier. (**Lian,** p5 C1:43 through C2:10; 'Value of uncertainty' of applicant is equivalent to 'uncertainty correlation coefficient (UCC)' of Lian.)

Claim 8

Lian anticipates selecting instances uncertain the first classifier includes selecting instances having uncertainty values relative to a predetermined threshold. (**Lian,** p3, C1:27-34; 'Predetermined threshold' of applicant is equivalent to 'θ' of Lian.)

Claim 9

Lian anticipates selecting instances having uncertainty valuesincludes selecting instances having uncertainty values below the predetermined threshold. (**Lian,** p3, C1:27-34; 'Predetermined threshold' of applicant is equivalent to 'θ' of Lian.)

Claim 11

Lian anticipates exchanging information between the first labeled and the second labeled set to form at least one shared set. (**Lian,** p1, C1:29 through C2:5; 'Exchanging information' of applicant is equivalent to 'exchanging the labeled data' of Lian.)

Claim 12

Lian anticipates reconstructing the first and second classifiers using the at least one shared set. (**Lian,** p1, C1:29 through C2:5; 'Reconstructing' of applicant is equivalent to 'training' of Lian.)

Claim 13

Lian anticipates labeling the instances uncertain to the first classifier includes assigning instances in the first labeled set to a first set of classes, and wherein labeling the instances uncertain to the second classifier includes assigning instances in the second labeled set to be a second set of classes (**Lian,** p3, Figure 1; 'Assigning instances' of applicant is equivalent to assigning a value to a class in either language (1 or 2) of Lian.)

Claim 18

Lian anticipates selecting unlabeled data that is relatively certain with respect to the first classifier. (**Lian,** p6, C2:4-9; Lian illustrates the classifiers are driven by 'uncertainty reduction' which selects unlabeled data and asks the other classifier for assistance in classifying it.)

Claim 19

Lian anticipates selecting relative certain unlabeled data includes selecting the most certain unlabeled data with respect to the first classifier. (**Lian,** p6, C2:4-9; 'Most

certain unlabeled data' of applicant is equivalent to 'most uncertain unlabelled

instances' of Lian.)

Claim 20

Lian anticipates selecting instances uncertain to the classifier includes selecting

data in the relatively certain data. (**Lian,** p7, C1:15-21; 'Relative certain data' of

applicant is equivalent to 'most certain a_y instances' of Lian.)

Claim 21

Lian anticipates selecting a instances uncertain to the first classifier includes

selecting data not in the relatively certain unlabeled data. (**Lian,** p7, C1:15-21;

'Not in the relative certain unlabeled data ' of applicant is equivalent to 'most uncertain

b_y' of Lian.)

Claim 22

Lian anticipates constructing a first classifier and a second classifier using

received labeled instances (**Lian,** p2, C2:26-36; 'First and second classifier' of applicant

is equivalent to the functions h_1 and h_2 of Lian.); using the first classifier to select

unlabeled instances that are certain with respect to the first classifier (**Lian,** p3, C1:27-

34; 'Uncertain with respect to the first classifier' of applicant is equivalent to '$U(h_1) = P(\{x$

$\mid h_1(x) = \perp, x \in X \})$' of Lian.); selecting instances uncertain with respect to the second

classifier data from among the instances certain with respect to the first classifier to

form a first set of unlabeled instances (**Lian,** p3, C2:11-24'Using the second classifier'

of applicant is equivalent to 'with respect to' of Lian. 'Labeling the instance of uncertain'

of applicant is equivalent to 'UR' of Lian. UR($h_1 \setminus h_2$) = P ({ x | h_1 (x) = $\perp$, h_2 (x) $\neq \perp$, x $\in$

X }); using the second classifier to select unlabeled instances that are certain with

respect to the second classifier (**Lian,** p3, C1:27-34; 'Uncertain with respect to the

second classifier' of applicant is equivalent to '$U(h_2)$ = P({x | $h_2(x)$ = $\perp$, x $\in$ X })' of Lian.);

and selecting instances uncertain with respect to the first classifier from among the

instances certain with respect to the second classifier to form a second set of unlabeled

instances. (**Lian,** p3, C2:11-24'Using the first classifier' of applicant is equivalent to 'with

respect to' of Lian. 'Labeling the instance of uncertain' of applicant is equivalent to 'UR'

of Lian. UR($h_2 \setminus h_1$) = P ({ x | h_2 (x) = $\perp$, h_1 (x) $\neq \perp$, x $\in$ X })

Claim 23

Lian anticipates labeling the first set of unlabeled instances using the first

classifier to form a first labeled set (**Lian,** p6, C2:4-9; One classifier uses the other

classifier for labeling assistance.); labeling the second set of unlabeled instances using

the second classifier; and to form a second labeled set (**Lian,** p6, C2:4-9; One classifier

uses the other classifier for labeling assistance.); adding the first labeled set and the

second labeled set to the received labeled instances to form an augmented set. (**Lian,**

p6, C2:4-9; With each classifier helping the other with the resulting classifications

performed by the other classifier is equivalent to the 'augmented set' of applicant.)

Claim 24

Lian anticipates reconstructing the first classifier and the second classifier using

the augmented set. (**Lian,** p6, C2:4-9; With the new classifications which are performed

by the other classifier, the results are which added the initial classifier classifications or

reconstruction or augmented.)

Claim 25

Lian anticipates reconstructing the first and the second classifiers includes

iteratively reconstructing the first and the second classifiers for each class of unlabeled

instances. (**Lian,** p2, C1:1-19; 'iteratively' of applicant is equivalent to 'repeatedly' of

Lian.)

Claim 27

Lian anticipates receiving labeled data (**Lian,** p5, C2:33-38; 'Labeled data' of

applicant is equivalent to 'labeled training set' of Lian.); receiving unlabeled data (**Lian,**

p5, C2:33-38; 'Unlabeled data' of applicant is equivalent to 'unlabeled training set' of

Lian.); constructing a first classifier and a second classifier using the labeled data (**Lian,**

p2, C2:26-36; 'First and second classifier' of applicant is equivalent to the functions h_1

and h_2 of Lian.); using the first classifier to select some of the unlabeled data that is

certain with respect to the first classifier (**Lian,** p3, C1:27-34; 'Uncertain with respect to

the first classifier' of applicant is equivalent to '$U(h_1) = P(\{x \mid h_1(x) = \perp, x \in X \})$' of Lian.);

selecting unlabeled data uncertain with respect to the second classifier from among the unlabeled data that is certain with respect to the first classifier to form a first set of unlabeled data (**Lian,** p3, C2:11-24'Using the second classifier' of applicant is equivalent to 'with respect to' of Lian. 'Labeling the instance of uncertain' of applicant is equivalent to 'UR' of Lian. UR($h_1 \setminus h_2$) = P ({ x | h_1 (x) = $\perp$, h_2 (x) $\neq \perp$, x $\in$ X }); and using the second classifier to select some of the unlabeled data that is certain with respect to the second classifier (**Lian,** p3, C1:27-34; 'Uncertain with respect to the second classifier' of applicant is equivalent to '$U(h_2)$ = P({x | h_2(x) = $\perp$, x $\in$ X })' of Lian.); and selecting unlabeled data uncertain with respect to the first classifier from among the unlabeled data that is certain with respect to the second classifier to form a second set of unlabeled data. (**Lian,** p3, C2:11-24'Using the first classifier' of applicant is equivalent to 'with respect to' of Lian. 'Labeling the instance of uncertain' of applicant is equivalent to 'UR' of Lian. UR($h_2 \setminus h_1$) = P ({ x | h_2 (x) = $\perp$, h_1 (x) $\neq \perp$, x $\in$ X })

Claim 28

Lian anticipates receiving unlabeled data includes receiving data capable of being assigned to classes, and wherein receiving labeled data includes receiving data assigned to classes. (**Lian,** p5, C2:33-38; 'labeled data' of applicant is equivalent to 'labeled training set' of Lian. 'Unlabeled data' of applicant is equivalent to 'unlabeled training sets' of Lian.)

Claim 29

Lian anticipates reconstructing the first and the second classifier for each class.

(**Lian,** p6, C2:4-9; With each classifier helping the other with the resulting classifications

performed by the other classifier is equivalent to the 'augmented set' of applicant. With

the new classifications which are performed by the other classifier, the results are which

added the initial classifier classifications or reconstruction.)

Claim 30

Lian anticipates applying the first classifier to the first unlabeled set to form a first

labeled set; and applying the second classifier to the second labeled set to form a

second labeled set. (**Lian,** p6, C2:4-9; One classifier uses the other classifier for

labeling assistance.)

Claim 31

Lian anticipates augmenting the received labeled data with the first labeled set

and the second labeled set to form an augmented set. (**Lian,** p6, C2:4-9; With the new

classifications which are performed by the other classifier, the results are which added

the initial classifier classifications or reconstruction or augmented.)

Claim 32

Lian anticipates using the augmented set of labeled data to retrain the first

classifier and the second classifier to form a retrained first classifier and a retrained

second classifier. (**Lian,** p2, C2:37-46; 'Retraining the first and second classifier' of

applicant is equivalent to 'co-training' of Lian.)

Claim 33

Lian anticipates applying the first classifier to the first unlabeled set includes

calculating probabilities that the first classifier is unable to assign some unlabeled data

to classes. (**Lian,** p3, C1:27-34; 'Probabilities' of applicant is equivalent to 'P' of Lian.)

Claim 34

Lian anticipates calculating probabilities includes calculating values of

uncertainty. (**Lian,** p3, C1:27-34; 'Probabilities' of applicant is equivalent to 'P' of Lian.

'Value of uncertainty' of applicant is equivalent to 'U(h)' of Lian.)

Claim 35

Lian anticipates calculating values of uncertainty includes calculating values of

uncertainty relative to a predetermined threshold. (**Lian,** p3, C1:27-34; 'Predetermined

threshold' of applicant is equivalent to 'θ' of Lian.)

Claim 36

Lian anticipates receiving labeled data (**Lian,** p5, C2:33-38; 'Labeled data' of

applicant is equivalent to 'labeled training set' of Lian.); receiving unlabeled data (**Lian,**

p5, C2:33-38; 'Unlabeled data' of applicant is equivalent to 'unlabeled training set' of

Lian.); constructing a first classifier and a second classifier with the received labeled

data (**Lian,** p2, C2:26-36; 'First and second classifier' of applicant is equivalent to the

functions h_1 and h_2 of Lian.); selecting a portion of unlabeled data that is uncertain for

the first classifier (**Lian,** p3, C1:27-34; 'Uncertain with respect to the first classifier' of

applicant is equivalent to '$U(h_1) = P(\{x \mid h_1(x) = \perp, x \in X \})$' of Lian.); and assigning

classes to the portion of unlabeled data using the second classifier to form a first

labeled set (**Lian,** p3, C2:11-24'Using the second classifier' of applicant is equivalent to

'with respect to' of Lian. 'Labeling the instance of uncertain' of applicant is equivalent to

'UR' of Lian. $UR(h_1 \setminus h_2) = P (\{ x \mid h_1 (x) = \perp, h_2 (x) \neq \perp, x \in X \})$; selecting a portion of

unlabeled data that is uncertain for the second classifier (**Lian,** p3, C1:27-34; 'Uncertain

with respect to the second classifier' of applicant is equivalent to '$U(h_2) = P(\{x \mid h_2(x) =$

$\perp, x \in X \})$' of Lian.); and assigning classes to the portion of unlabeled data uncertain

for the second classifier using the first classifier to form a second labeled set. (**Lian,** p3,

C2:11-24'Using the first classifier' of applicant is equivalent to 'with respect to' of Lian.

'Labeling the instance of uncertain' of applicant is equivalent to 'UR' of Lian. $UR(h_2 \setminus h_1$

$) = P (\{ x \mid h_2 (x) = \perp, h_1 (x) \neq \perp, x \in X \})$

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 14-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over

the Lian, as set forth above, and further in view of Gil ('Formalizing Spider Diagrams',

referred to as **Gil**)

Claim 14.

Lian fails to particularly call for the first set of classes and the second set of

classes are the same.

Gil teaches teach the first set of classes and the second set of classes are the

same. (**Gil,** p2, Fig 1; The class B $\cap$ C is the same class C $\cap$ B, just labeled different.) It

would have been obvious to a person having ordinary skill in the art at the time of

applicant's invention to modify the teachings of Lian by illustrating that some data sets

can be exactly the same as taught by Gil to have the first set of classes and the second

set of classes are the same.

For the purpose of possible future use of deleting one of the two class due to the

fact they occupy the same space.

Claim 15.

Lian fails to particularly call for set of classes and the second set of classes are different.

Gil teaches first set of classes and the second set of classes are different.

(**Gil,** p2, Fig 1; Class 'A' and 'B' are different because they don't occupy the same space.) It would have been obvious to a person having ordinary skill in the art at the time of applicant's invention to modify the teachings of Lian by illustrating not all data sets are exactly the same as taught by Gil to have the first set of classes and the second set of classes are the same.

For the purpose of illustrating the fact that more than one class is needed.

Claim 16.

Lian fails to particularly call for first set of classes and the second set of classes are mutually exclusive.

Gil teaches first set of classes and the second set of classes are mutually exclusive. (**Gil,** p2, Fig 1; Class 'A' and 'C' are mutually exclusive because they don't occupy any common space.) It would have been obvious to a person having ordinary skill in the art at the time of applicant's invention to modify the teachings of Lian by illustrating the fact that some data sets have nothing in common as taught by Gil to have first set of classes and the second set of classes are mutually exclusive.

For the purpose of illustrating the fact there will be no ambiguity between these two classes.

Claim 17.

Lian fails to particularly call for first set of classes and the second set of classes overlap by having classes in common.

Gil teaches first set of classes and the second set of classes overlap by having classes in common. (**Gil,** p2 Fig 1; The shaded area between class 'B' and 'C' is the intersection between 'B' and 'C'. By definition of intersection, is the area (classes) in common between 'B' and 'C'.) It would have been obvious to a person having ordinary skill in the art at the time of applicant's invention to modify the teachings of Lian by illustrating the fact that some data sets do have some common elements as taught by Gil to have first set of classes and the second set of classes overlap by having classes in common.

For the purpose of illustrating the fact there will be ambiguity between these two classes.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having

ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over the Lian, as set forth above, and further in view of Kokubo (U. S. Patent Publication 20030144899, referred to as **Kokubo**)

Claim 26.

Lain fail to particularly call for the computer readable medium of claim 1.

Kokubo teaches the computer readable medium of claim 1. (**Kokubo,** ¶0245) It would have been obvious to a person having ordinary skill in the art at the time of applicant's invention to modify the teachings of Lian by having the system stored on a medium which a computer can use as taught by Kokubo to have the computer readable medium of claim 1.

For the purpose of storing the original version and if convergence occurred or storing an updated or augmented version of the system.

Response to Arguments

5.   Applicant's arguments filed on July 5, 2006 for claims 1-9, 11-36 have been fully

considered but are not persuasive.

6.   In reference to the Applicant's argument:

        This communication is in response to the Office Action mailed on March 8,
2006.   In the office action, claims 1-37 were pending on which claims 1-37 were
rejected. With this amendment, claims 1-9, and 11-36 are pending and claims 10 and
37 have been cancelled.

        The Office Action first reports that claims 1-37 were rejected under U.S.C. 35
101 for statutory subject matter in that claimed invention must be a useful, concrete
and tangible result." The rejection based on statutory subject matter is respectfully
traversed. It is respectfully submitted that classification is known by those skilled in the
art to be useful in many applications involving probabilities. For example, classification
can be used for speech or handwriting recognition, Internet search engines, or data
mining. In the background section of the present application, applicants specifically
provide that classifiers can be used to 'identify a topic for a we page." [See
specification, page 1, lines 24-26]

Examiner's response:

        The specification does not define the invention but the claims do. The

classifiers need to be employed in a real world application to be accepted. Examples

of which might be a language translation method, or a friend/foe target acquisition in

regards to a weapon system or a political election analyzer for elected offices. The

result has to be a practical application. First Office Action applies.

7.   In reference to the Applicant's argument:

        The office action next reports that claims 18-21 were rejected under U.S.C. 112
as being indefinite. In particular, these claims use the term "first certain portion" which
is a term not defined at all in the specification. Claims 18-21 have been amended. It is

respectfully requested that the above rejection based on claims U.S.C. 112 be withdrawn.

Examiner's response:

Examiner withdraws the 35 U.S.C. 112 rejection.

8.   In reference to the Applicant's argument:

The Office Action next reports that claims 2 and 27 were rejected under U.S.C. 112 as being indefinite for failing to particulary point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, the Office Action states that these two claims use the phrase 'selecting unlabeled instances or data' but that this phrase is not found in the specification. It is believed that claim 2 does not include the phrase 'selecting unlabeled instances or data' but that this phrase is not found in the specification. It is believed that the examiner probably intended to claim 22. Thus, clarification with respect to claim 2 is respectfully requested.

Nevertheless, both claims 22 and 27 have been amended in a similar manner to divide the step of selecting unlabeled instances that are certain with respect to the first classifier and uncertain with respect to the second classifier into at least a two step process. This at least two-step process is believed to be described in the specification at least at page 23, lines 15-26.

Examiner's response:

Examiner withdraws the 35 U.S.C. 112 rejection.

9.   In reference to the Applicant's argument:

The Office Action next reports that claims 1-3, 10-13, 18-25, 27-33, 36-37 were rejected under U.S.C. 35 102(b) as being anticipated by 'Word Translation Disambiguation Using Bilingual Bootstrapping' (hereinafter Li). It is noted that the one of the authors of this reference, Hang Li is also one of the present inventors. Reference

Li, describes an older classification method. The present inventions are considered advantageous due especially to the additional features of uncertainty reduction. In most embodiments, uncertainty reduction is performed y first selecting instances that are uncertain with respect to one classifier and then classifying those instances using another classifier. It is believed that uncertainty reduction as disclosed in the present invention boosts classification performance by leading to greater classification accuracy.

Claim 1 has been amended to recite a computer readable medium including instructions readable by a computer, which when implemented, cause the computer to classify data comprising the steps of: receiving labeled data; receiving unlabeled data; constructing a first classifier and a second classifier using the labeled data; performing uncertainty reduction comprising selecting instances from the unlabeled data that are uncertain with respect to the first classifier; and selecting instances from the unlabeled data that are uncertain with respect to the second classifier; labeling the instances uncertain to the first classifier using the second classifier to form a first labeled set; and labeling the instances uncertain to the second classifier using the first classifier to form a second labeled set.

Thus claim 1 has been amended to more explicitly define the feature of uncertainty reduction described above. In light of the amendments to claim 1, it is believed that the present rejection of claim 1 has been made mote. Thus, claims 2-21 depend on claim 1 and are also presented for favorable action.

Claim 22 has been amended to recite a computer readable medium including instructions readable by a computer, which when implemented, cause the computer to classify data comprising the steps of: constructing a first classifier and a second classifier using received labeled instances; using the first classifier to select unlabeled instances that are certain with respect to the first classifier; selecting instances uncertain with respect to the second classifier to form a first set of unlabeled instances; and using the second classifier to select unlabeled instances that are certain with respect to the second classifier; and selecting instances uncertain with respect to the first classifier from among the instances certain with respect to the second classifier to form a second set of unlabeled instances.

The amendments to claim 22 are similar to the amendments to claim 1. Thus, remarks relating to claim 1 are incorporated by reference. It is noted that the amendment of claim 22 are believed supported in the specification at least at page 23, lines 15-29.

Claim 22 now clarifies that an at least a two-step process is used to the first select instances that are first certain to one of the classifiers. Then, from among these certain instances a smaller number of instances are selected that are uncertain to the other classifier. It is noted that this process is also parallel. Claim 23 depends on claim

22 and further includes further uncertainty reduction where the first set of unlabeled instances (generated in accordance with claim 22) are labeled using the first classifier and the second set of unlabeled instances (generated in accordance with claim 22) are labeled using the second classifier.

It is believed that the cited art does not teach or suggest this parallel two step process and uncertainty reduction. Thus it is believed that claim 22 is patentable over the cited art. Claims 23-25 depend on claim 1 and are believed to be separately patentable. Reconsideration and allowance of claims 22-25 are respectfully requested.

Independent claim 27 has been amended to recite a method of training a classifier, the method comprises: receiving labeled data; receiving unlabeled data; constructing a firs classifier and a second classifier using the labeled data; using the first classifier to select some of the unlabeled data that is certain with respect to the first classifier; selecting unlabeled data uncertain with respect to the second classifier from among the unlabeled data that is certain with respect to the first classifier to form a first set of unlabeled data; and using the second classifier to select some of the unlabeled data that is certain with respect to the second classifier and selecting unlabeled data uncertain with respect to the first classifier from among the unlabeled data that is certain with respect to the second classifier to form a second set of unlabeled data.

Claim 27 has been amended to further refine the feature of uncertainty reduction in a manner similar to claims 1 and 22. Remarks relating to claims 1 and 22 are herein incorporated by reference. Thus, claim 27 is believed to be patentable over the cited art. Claims 28-35 depend on claim 27 and are believed to be separately patentable. Reconsideration and allowance of claims 27-35 are respectfully requested.

The Office Action next reports that claims 4-9, 14-17, 26 and 34-35 were rejected under U.S.C. 103 as being unpatentable over Li in view of 'A Sequential Algorithm for Training Text Classifiers' herein referred to as Lewis. Claims 4-9, 14-17 and 26 depend on claim 1, which ha been amended. Claims 34-35 depend on claim 27, which has also been amended. It is submitted that the amendments to claims 1 and 27 change the scope of claims 4-9, 14-17, 26 and 34-35. Thus, it is believed that the rejection of these dependent claims has been made mote.

Claim 36 has been amended with the additional features of claim 37, now cancelled. Claim 36 is presented for examination and favorable action.

Examiner's response:

Lian addresses the concept of a uncertainty reduction algorithm. This is

accomplished by using two classifiers using the other to classify the 'most uncertain'

instance (**Lian,** section 5). This method illustrated that both classifiers aid one another

and reduce a 'Uncertainty Correlation Coefficient'. This also illustrates a parallel two

step process which the invention claims. (**Lian,** abstract)

Examination Considerations

10.   The claims and only the claims form the metes and bounds of the invention.

"Office personnel are to give the claims their broadest reasonable interpretation in light

of the supporting disclosure. *In re Morris*, 127 F.3d 1048, 1054-55, 44USPQ2d 1023,

1027-28 (Fed. Cir. 1997). Limitations appearing in the specification but not recited in

the claim are not read into the claim. *In re Prater*, 415 F.2d, 1393, 1404-05, 162 USPQ

541, 550-551 (CCPA 1969)" (MPEP p 2100-8, c 2, I 45-48; p 2100-9, c 1, I 1-4). The

Examiner has the full latitude to interpret each claim in the broadest reasonable sense.

Examiner will reference prior art using terminology familiar to one of ordinary skill in the

art. Such an approach is broad in concept and can be either explicit or implicit in

meaning.

11.   Examiner's Notes are provided to assist the applicant to better understand the

nature of the prior art, application of such prior art and, as appropriate, to further

indicate other prior art that maybe applied in other office actions. Such comments are

entirely consistent with the intent and sprit of compact prosecution. However, and

unless otherwise stated, the Examiner's Notes are not prior art but link to prior art that one of ordinary skill in the art would find inherently appropriate.

12.   Examiner's Opinion: Paragraphs 10 and 11 apply. The Examiner has full latitude to interpret each claim in the broadest reasonable sense.

Conclusion

13.   Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

14.   Claims 1-9, 11-36 are rejected.

Correspondence Information

15.   Any inquiry concerning this information or related to the subject disclosure should

be directed to the Examiner Peter Coughlan, whose telephone number is (571) 272-

5990. The Examiner can be reached on Monday through Friday from 7:15 a.m. to 3:45

p.m.

        If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's

supervisor David Vincent can be reached at (571) 272-3687. Any response to this

office action should be mailed to:

        Commissioner of Patents and Trademarks,

        Washington, D. C. 20231;

Hand delivered to:

        Receptionist,

        Customer Service Window,

        Randolph Building,

401 Dulany Street,

Alexandria, Virginia 22313,

(located on the first floor of the south side of the Randolph Building);

or faxed to:

(571) 273-8300 (for formal communications intended for entry.)

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

unpublished applications is available through Private PAIR only. For more information

about the PAIR system, see http://pair-direct.uspto.gov. Should you have any questions

on access to Private PAIR system, contact the Electronic Business Center (EBC) at

866-217-9197 (toll free).

Peter Coughlan

8/21/2006